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Preliminary Assessment of Mitigation Performance Under the National Environmental Policy Act (NEPA) In Selected Cases from Region 1, U.S. EPA

John F. Kennedy School of Government, Cambridge, MA

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The use of mitigation to satisfy the requirements of the National Environmental Policy Act (NEPA) for major federal actions is an important, frequently controversial, feature of the NEPA process. Increasingly, environmental impact statements (EIS) rely on mitigation to defend the feasibility of project design and selection. The Environmental Protection Agency (EPA) plays a crucial role in the NEPA process under their mandate to review and comment on proposed mitigation actions, and through negotiation with lead agencies and other parties. Wide variation exists in project proposals subject to NEPA review and in the detail given to mitigation. Ths report is a preliminary assessment of whether commitments to mitigate environmental damage were kept and what factors influenced mitigation performance. Four completed NEPA cases in the New England Region of EPA (Region I) were examined where mitigation was a key determinant in the selection of the final project alternative in an EIS. Research consisted of a combination of personal interviews, site visits, and review of state, federal and local documents

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Abstract

The use of mitigation to satisfy the requirements of the National Environmental Policy Act (NEPA) for major federal actions is an important, frequently controversial, feature of the NEPA process. Increasingly, environmental impact statements (EIS) rely on mitigation to defend the feasibility of project design and selection. The Environmental Protection Agency (EPA) plays a crucial role in the NEPA process under their mandate to review and comment on proposed mitigation actions, and through negotiation with lead agencies and other parties. Wide variation exists in project proposals subject to NEPA review and in the detail given to mitigation. This report is a preliminary assessment of whether commitments to mitigate environmental damage were kept and what factors influenced mitigation performance. Four completed NEPA cases in the New England Region of EPA (Region 1) were examined where mitigation was a key determinant in the selection of the final project alternative in an EIS. Research consisted of a combination of personal interviews, site visits, and review of state, federal and local documents.

This report was conducted by Eric Palola, a masters degree candidate at the Kennedy School of Government, during July and August of 1989 at the request and supervision of Region 1, EPA. The author appreciates the support and advice received from the staff of the Region 1 Office of Government Relations and Environmental Review; notably, Stephen Ells, Betsy Higgins, Patience Whitten and Don Cooke. Support for this research was provided by the EPA National Environmental Network Management Studies fellowship program.

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I. Executive Summary

The National Environmental Policy Act of 1969 (NEPA) requires the preparation and filing of environmental impact statements for all federal actions which have significant and forseeable environmental impacts. Mitigation of environmental harm is a primary goal of the the NEPA process and is accomplished in two ways in accordance with federal rules. The preferred method seeks maximum avoidance of environmental harm through careful estimation of project need and site capabilities; the second method entails the use of specific measures that offset or alleviate probable environmental damages.

This report examines the latter approach in selected NEPA cases within the New England region of the Environmental Protection Agency, Region 1. EPA's role under NEPA is substantial; it is both guardian and advocate of NEPA through regulatory oversight of various permits required by new projects and through broad review authority of federal actions under Section 309 of the Clean Air Act.

The design, scope, and implementability of needed mitigation measures are key issues during NEPA review. Mitigation proposals have faced increased scrutiny due to the evolution of NEPA regulations, judicial opinions concerning the proper scope of mitigation, new technical proficiency in mitigation strategies, and changing public preferences that favor protection of public health and environmental quality. Little data exists, however, that demonstrates the effectiveness of mitigation once it is implemented during and subsequent to project construction. The data that does exists is usually confined to specific state or local permit programs where monitoring or enforcement actions are involved.

There is no comprehensive follow-up to mitigation promises made during NEPA review. Moreover, the administrative mechanisms to ensure that mitigation proposals result in desired levels of environmental quality are not well understood. This report thus attempts to outline issues and provide insight on mitigation through a preliminary analysis of mitigation performance.

From the cases analyzed in this report, mitigation is clearly an unpredictable aspect of the NEPA review process. This is due to many factors: widely varying mitigation needs between projects, diverse and inconstant capacities of the environment to assimilate new pollution, differing perceptions of project scope and need, and evolving mitigation techniques.

Four general recommendations (summarized below) are suggested for improving future NEPA mitigation efforts by the EPA. In addition, the report contains specific comments following each case discussion along with tables that indicate the status of mitigation measures intended in NEPA documents.

General Recommendations:

1. **More careful attention to the use, format, and circulation of the Record of Decision (ROD).** This is the final document produced in the NEPA process. Under federal regulations the ROD is expected to detail mitigation commitments and explain the basis for the project alternative selected. The commitments provided under ROD's reviewed here were often ambiguous, absent or inconsistent with the mitigation needs prescribed in the final EIS. One ROD, however, was very concise listing mitigation actions and responsibilities. ROD's are an important signal to all parties about the strength of mitigation commitments and provide a much needed level of accountability in the NEPA process.

2. **Thorough discussion as to the feasibility of mitigation proposed is necessary.** EPA should be clear in communications with the lead agency about expectations for the level of detail needed to adequately assess mitigation feasibility. Likewise, lead agencies must be prodded to investigate and divulge the necessary conditions for satisfactory implementation of mitigation measures. It is suggestd that EPA prepare guidelines to this effect.

3. **Cost-effectiveness analysis should be used to understand and compare requisite levels of public and private financial commitments needed to carry out mitigation.** Such analysis depends on the assumption that environmentally damaging EIS project alternatives will demand more costly, long-term mitigation. The goal of cost-effectiveness analysis is not to find the "cheapest basket" of mitigation measures or engage in quantification of environmental benefits but instead to provide realistic information about the cost (and thus feasibilty) of mitigation compliance and discover whether public officials, especially state and local agencies, are able to afford frequently complex mitigation and monitoring needs.

4. A final recommendation points to **a variety of techniques that were observed to enhance mitigation performance** during the NEPA process. These include:

o A concise listing of mitigation needs and agreements in the final environmental impact statement and record of decision.

o Centralizing of authority or designation of a coordinator for all mitigation actions associated with the project.

o Conscientious efforts by the lead agency to promote community involvement throughout each stage of the NEPA process.

o Looking for complementarity in mitigation measures; actions that serve dual or multiple purposes in minimizing environmental damage.

o Keen attention to communications between state, federal and local agencies during the NEPA process and during implementation.

II. Project Overview

"But yet it is folly to undertake works of this or any other kind, without first knowing that we are able to finish them -- as half finished work generally proves to be labor lost"

- Abraham Lincoln 1832
Communication to the People of
Sangamo County

Each year the Region I office of EPA reviews and comments on approximately 25-30 environmental impact statements for proposed projects throughout New England that involve major federal actions, such as licenses, grants and new construction. These proposals are required by Congress to comply with provisions of the 1969 National Environmental Policy Act (NEPA, 42 U.S.C. §4321-4347) the nation's first comprehensive environmental statute affecting federal government decisions. Under NEPA and Section 309 of the Clean Air Act (42 U.S.C. §7609), EPA has a broad reponsibility to review and comment on federal government actions which significantly affect the environment or cause reasonably forseeable environmental impacts.

Through a process of information gathering, comparative analysis, and public input contained in draft and final environmental impact statements (EIS's), NEPA attempts to leverage federal agency decisions that avoid and minimize environmental harm. The policy and guidelines under which NEPA impact statements are written, including provisions for mitigation, are contained in regulations issued and amended by the executive level Council on Environmental Quality, (40 CFR § 1500-1508) and have been recently augmented by judicial opinions of the U.S. Supreme Court.*

Central to the analysis in an EIS is a weighing of various project alternatives and accompanying impacts to air, water, wildlife and other natural resources. Selection of a final project alternative is based on its ability to fulfill the project purpose--as defined from a broad public perspective--the degree of environmental harm and efforts to avoid it, and the availability of mitigation measures that are both scientifically feasible and adminstratively obtainable.

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* see Appendix 2 summarizing 1989 Methow and Marsh decisions. Regarding scope of mitigation review see: City of Davis v. Coleman 521 F.2nd 661 (1975), Citizens for Responsible Area Growth v. Adams 477 F.Supp. 994 (1979), Kleppe v. Sierra Club 427 U.S. 390,402 (1976) or Sierra Club v. Marsh No.85-1098, 1st Cir.(1985)

Not surprisingly, for projects with clear environmental impacts, mitigation proposals become a focal point around which project proponents and adversaries often clash. While considerable administrative and technical effort goes into identifying, negotiating, and scheduling needed mitigation measures within impact statements, there is woefully little evidence that indicates mitigation commitments are generally adhered to or successfully implemented after the final EIS is circulated and project work has begun. By revisiting several projects that have already completed the NEPA process this report attempts to understand the issues associated with mitigation performance and thus provide EPA additional insight when considering mitigation proposals in future NEPA reviews.

Mitigation under NEPA is achieved in two ways: first, and most preferably, by **avoiding** adverse impacts through the selection of the most environmentally benign project alternative. Avoidance of environmental harm is an important and critical threshold test in the faithful application of NEPA; it reflects one of the earliest statements of Congressional intent on the preference of pollution prevention as opposed to pollution control, a concept undergoing revival as the limits, costs, and environmental results of conventional regulatory apparatus are better understood.

The second step in NEPA mitigation focuses on correcting project-specific problems once a preferred alternative has been identified by the lead agency. This aspect of mitigation usually emphasizes a "pollution control strategy"; specific damages that accrue from the lead agency's preferred alternative are listed and mitigating actions are proposed to alleviate or minimize these damages.

This report focuses on the latter approach. It is important to note, however, that the two steps are not separable. The thoroughness to which an agency applies avoidance as a mitigation technique is pivotal in the design, cost, and effectiveness of the mitigation measures that accompany the final project. Difficulties in mitigation performance are often rooted in an agency's reluctance to thoroughly involve both steps in the NEPA review process; a tendency driven by project need (both real and perceived) and early commitments to project design and scope.

The cases reviewed here consist of widely differing project purposes, scale and attention to mitigation. Understandably, the small sample size and varying circumstances between each case do not allow for conventional quantitative analysis. The report is fundamentally a compilation and distillation of personal views on the NEPA process for each project reviewed. Potential survey models, however, are discussed at the end of this report in view of a larger research effort in the future.

Interpretations of mitigation success inevitably depend on "where you sit" in the congregation of NEPA. Perceptions about mitigation rely strongly on one's position in the process: project beneficiaries are likely to be more optimistic about mitigation success than those who must regulate and monitor the impacts or adjust to the negative environmental effects of a new project. Initial agreement over project need or project purpose is a key ingredient in the ability to gain consensus on mitigation measures.

Assessing how well expectations about mitigation have been met across public and private parties invites a panopoly of issues about NEPA procedures, intergovernmental relations, the capacity of government to implement and enforce, and its ability to communicate with the affected public. These kinds of issues are distinct from questions over technical feasibility of mitigation, choosing the "right model," or measuring environmental quality. And it is these issues that often have a more profound affect on the disposition of mitigation and the NEPA process in general.

The author relied on and appreciates the willingness by all parties in these cases to provide candid and thoughtful responses regarding mitigation.

* * * *

III. Factors That Influence Mitigation Performance

Successful mitigation was observed to be not only dependent on lead agency interest and dedication but also influenced by the involvement of separate regulatory agencies, availability of funding from federal and local agencies, the sequencing of project actions, and the support and attention of the affected community.

Encouragingly, it was found that support of NEPA remains strong among those involved in these cases. Several people interviewed were especially supportive that EPA was attempting to track mitigation completion and compliance. It was also emphasized, however, that the seemingly colossal effort of time, expertise and money required to prepare comprehensive impact statements for large projects was systematically undermined by deficient implementation of mitigation measures. The success of mitigation appears to directly influence prevailing attitudes toward NEPA.

Effective mitigation was generally seen to be a function of the following factors:

1. Clearly assigned **authority** over the implementation of mitigation measures. For example, the presence and involvement of the MassPort planning director in the Bird Island Flats case, who supervised explicit mitigation commitments, demonstrated the effectiveness of centralizing responsibility for mitigation within one agency.

2. The **format** of Final Environmental Impact Statements (FEIS) and Records of Decision (ROD). For instance, rather than listing mitigation commitments in an ROD, some mitigation measures--especially lower priority ones--were buried in the middle of impact statements without discussion as to when they would be implemented or who was responsible.

Alternatively, an ROD might enthusiastically cross-reference mitigation measures contained in the FSEIS that, upon inspection, were vague or gave little indication as to the commitment towards that measure. And one FEIS reviewed, (the Barnstable case) contained a curious section entitled "Mitigation Measures, Assurances and Coordination," a chapter which implied a discussion of specific mitigation commitments; in actuality it consisted of a one-page letter and two pages of minutes from a meeting about mitigation among various parties. Some statements or ROD's, however, were very straightforward in showing what specific actions were committed to and which parties were responsible for implementation. In these situations it was easier to trace and assess the performance of mitigation.

3. The existence and integrity of federal, state and local **permitting programs** that incorporate agreed-to mitigation measures. The ability to transfer NEPA measures into an enforceable

regulatory program is the most direct means of obtaining compliance, however, this does not necessarily assure that mitigation will performed. In one case reviewed here a local water supply district had to repeatedly pursue the attention of state agencies to enforce erosion contol measures necessary to preventing turbidity in drinking supplies; these measures, according to the district, were regularly violated during contruction.

Permitting programs also introduce issues of "regulatory sovereignty" in NEPA. Since NEPA has been typically interpreted to by the courts to be an "action-forcing" statute rather than "action-determining," there is often confusion about the detail required in identifying and discussing mitigation within NEPA. The independent and various authorities of 3rd-party agencies creates a natural incentive to leave the details of mitigation to those who write and condition permits. It is these independent, often carefully guarded, jurisdictions which can deter and even prevent comprehensive review of mitigation in NEPA.

4. EIS detail in discussing **feasibility** of mitigation and the likelihood of its implementation. This is perhaps the most pervasive problem inhibiting successful mitigation. Due in part to incomplete information or unforseen circumstances, and in part to false assurances or the incentive to represent a stronger commitment to mitigation than actually intended, the lack of EIS attention to feasibility was a frequent impediment to effective implementation.

* * * *

IV. Summary Conclusions and General Recommendations

The case studies presented indicate that compliance with agreed-upon mitigation, as represented in NEPA documents, is unpredictable and inconsistent. In fact, these cases showed that while a majority of EIS-agreed mitigation actions were attempted, and in most instances completed, a wide spectrum of mitigation compliance was apparent. Compliance ranged from outright disagreement by a lead agency over a particular measure (despite commitments in a FEIS or ROD)* to unintentional forgetfulness, to haphazard or half-hearted compliance, to enthusiastic and vigorous implementation that in some instances went beyond the expected mitigation measures contained in the EIS.

Given this wide range of response to mitigation, the following section presents a brief explanation of the major issues that arose from these cases regarding mitigation and suggests, under each issue, corrective actions oriented around EPA's role in future NEPA mitigation efforts. Section (A) is generic in its treatment of mitigation issues (specific comments are offered in each case discussion that respond to particular mitigation issues and circumstances), while Section (B) lists techniques which were observed to contribute to successful mitigation implementation.

* * * *

(A) 1. <u>More Emphasis Needed on the EIS Record of Decision (ROD)</u>:

The important informational and explanatory role of an ROD to third parties and other government agencies should not be underestimated. As the final document in the NEPA review process, the presence and particularly the <u>format</u> of the ROD was seen as a key element in defining the level of commitment by a lead agency to mitigation and in notifying the public and other parties as to future and ongoing mitigation actions.

The ROD summarizes the reasons and circumstances supporting an EIS decision; it is the most visible linking of final project selection with necessary actions--such as mitigation--essential to carrying out the project or program in an environmentally sound manner. The ROD is also the primary mechanism for activating specific CEQ provisions which persuade implementation of certain mitigation actions, notably, CEQ's <u>non-discretionary</u> directive to lead agencies that permit conditions and project funding <u>shall</u> hinge on mitigation compliance. *

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*(<u>see</u> 40 CFR § 1505.2 and 1505.3. and CEQ's "Questions and Answers About the NEPA Regulations", question #34 (a-d), 1981)

a) It is recommended that Region I advise lead agencies, at the appropriate phase of the environmental review process (such as in final comments on a DEIS), to **carefully list and explain anticipated mitigation actions in a ROD** that support or facilitate the selected alternative. EPA should urge that meticulous attention be paid to describing which mitigation actions are committed to and adopted under the expectations and requirements of CEQ regulations specific to the preparation of ROD's. And, when possible, EPA should ask to review draft ROD's before the final decision.

The format and organization of information in the ROD's reviewed varied considerably and one of the cases (the Route 25 case which pre-dates CEQ amendments that mandate preparation of ROD's) did not publish one at all. The common theme of ROD's reviewed here tended towards restating the project purpose and justifying the selected alternative. The level of mitigation commitment expressed in ROD's ranged from almost no discussion, to a listing of "potential" mitigation actions or cross-referencing back to the FEIS, to a clear, comprehensive listing of committed-to mitigation.

b) The Record of Decision represents a response to the information developed in the FEIS as well as a signal to the affected community and governmental bodies about future agency conduct in mitigation efforts. Given that a FEIS for a large project is often hard to digest and review, wide circulation of the ROD should be encouraged so that all parties know what mitigation actions the decision requires and who will implement them. EPA should press agencies to write ROD's that do not merely defend the final project selection but explain why their decision avoids environmental damage and detail which mitigation measures will be used to offset the remaining impacts in a clear and coherent format.

2. **Feasibility of Proposed Mitigation Should be Emphasized**:

Within these cases many mitigation measures foundered as a result of inattention to practical circumstances affecting their implementability. Typical problems included lack of attention and discussion about compliance needs (such as potential administrative bottlenecks or staff shortages), funding requirements necessary for implementation, or reliance on optimistic assumptions about the qualitative effectiveness of certain mitigation measures.

a) Region 1 may want to prepare a brief 2-4 page outline that, in a positive but persuasive manner, briefs lead agencies and other parties as to EPA's expectations for addressing mitigation, particularly in the area of EIS attention to feasibility. This outline could be presented in scoping sessions or attached to scoping comments before work is begun on impact statements. It would serve to put lead agencies on notice as to the importance of addressing feasibility when proposing mitigation and underscore the CEQ directive that "agencies should not rely on the possibility of mitigation proposals as an excuse to avoid the EIS requirement,"*

(again, see CEQ's "Questions & Answers About the NEPA Regulations", #19a & 19b, CEQ, 1981.)

Such guidance might simply entail a listing of factors along with a brief discussion that agencies could refer to and consider when formulating mitigation measures. Examples include:

o making clear distinctions between possible (best-case) mitigation measures and feasible (likely-case) measures

o inclusion of funding and baseline information needs and expected availability of funds (see also #3 below)

o the probability of implementation, what kinds of oversight and enforcement capabilities exist within the lead agency's regulatory programs?

o discussion of "third party" roles; differentiating between mitigation measures which will be included in external regulatory programs versus those measures which are discretionary

o clarifying project and non-project specific actions

o listing priorities among mitigation actions; in what order should mitigation measures be completed, what aspects of the project rely on prior mitigation performance?

o context: is mitigation sensitive to surrounding conditions? i.e. new discharge to pristine watershed versus a discharge to a heavily polluted waterway

o guidance on the level of detail needed for mitigation under each alternative

b) Another important connection that EPA should discern early in the NEPA process is the relationship between a lead agency's own NEPA regulations (as they are developed under CEQ requirements in 40 CFR §1505.1), the types of mitigation measures that an agency is reasonably prepared to administer, and the mitigation requirements of the project in question. Intergovernmental relations are a big influence in NEPA reviews; knowledge of another agency's self-imposed NEPA procedures can alert EPA to unique mitigation prospects. As part of the scoping session, EPA may want to request a copy of the lead agency's NEPA procedures and encourage wide circulation among all interested parties in the EIS process in order to assure familiarity with the lead agency's approach.

3. **The Need for Cost-Effectiveness Analysis**:

Where information on mitigation costs are readily available or where reasonable estimates can be made for certain measures, EPA should encourage that the EIS discuss the short and long-term costs of implementing mitigation measures associated with each alternative in order to provide more a realistic picture of

obligations necessary during implementation. This recommendation assumes that more environmentally damaging alternatives imply and will likely incur more extensive and costly mitigation--a significant assumption that may not be valid in every case--but one which can be used as a reference point in comparing mitigation proposals.

Alternatively, EPA may want to introduce its own analysis that compares costs for proposed mitigation as a means of prompting selection of environmentally benign alternatives. Cost data is persuasive even if it is drawn inferentially from other cases; borrowed information appropriately qualified and used conservatively is usually better than no information and unexpected cost surprises during implementation.

Cost information may be particularly useful where extensive data gathering or long term monitoring are needed. Attention to mitigation costs can help in clarifying a project's purpose and in assessing the strength of mitigation commitments. It also serves notice on third parties about potential capital expenditures that may be required as a result of the project in the future.

Some considerations and caveats are in order though:

a) Mitigation costs are typically represented by two types of costs: those measures that are purchased at one point in time and those that require continuing outlays over time. It is important that attention be given to both in the EIS with the understanding that such figures are inherently conservative since they do not capture other "externality costs" to society from environmental degradation, particularly those impacts that endure or accumulate over long time horizons. While EPA cannot expect to invest in a full-scale cost analysis for each EIS, questioning the cost-effectiveness of key mitigation measures can focus attention on and improve their feasibility.

b) As mitigation costs likely represent only a small portion of overall project costs, there will be a tendency by project proponents to argue that they are insignificant. If all or part of certain mitigation costs are to be borne, however, by third parties, they may constitute significant expenditures in terms of staff time, equipment, or money outlays. This is paticularly evident for long term monitoring programs.

For example, the groundwater monitoring program for the Route 25 project was severely cut back after one year due to obvious state agency concern over lab costs, (roughly $100,000 for just one year of surface runoff and well monitoring.) In another example, the town planner in Barnstable, while commenting on a proposed groundwater plan promised in an EIS for airport expansion, worried about the lack of cost data needed for anticipating local capital expenditures since the town was expected to partially finance parts of the plan's testing and infrastructure recommendations.

c) An analysis of mitigation costs will probably be most useful in circumstances where clear discrepancies exist in mitigation needs between proposed EIS alternatives but where total project costs across each alternative are relatively the same. Where a preferred alternative is only **marginally** beneficial to a less environmentally harmful alternative, cost data may be used to argue for avoidance of environmental impacts since the figures will represent only a conservative estimate of the full social costs from environmental damages incurred by the project. (Unless, of course, the EIS includes a complete dynamic social cost-benefit analysis.)

d) Cost-effectiveness analysis can invite more politically treacherous discussions over quantifying environmental amenities and comparison with the tangible economic benefits that are driving many federal projects. The debate over project need, however, should be separated from assessment of mitigation costs which accompany any project alternative **as long as each alternative reasonably satisfies the same overall project purpose.**

e) Cost-effectiveness analysis may also be contrued to conform with NEPA policies in Section 102(C) that instruct agencies to prepare detailed statements on... "(v)...any irreversible or irretrievable commitment of resources which would be involved in the project should it be implemented." The valuation of environmental amenities is a difficult and inexact science and one that should probably be avoided within NEPA, however, the deliberation over necessary mitigation presents an opening for comparisons of known tangible costs that flow from a new project or program.

(B) Techniques Contributing To Successful Mitigation

While the above discussion suggests that many problems were encountered in mitigation in these cases, a look at the tables acompanying each case discussion shows that the majority of actions promised were attempted and in most cases completed. Often the timing or degree of completion was not what was prescribed or there were unforseen setbacks and corrections made along the way. Gross non-compliance was not as problematic as incomplete or delayed compliance.

The following section lists situations or techniques which appeared to assist in the performance of mitigation and which may be replicated in various ways by EPA to secure mitigation in the future. While some of these actions have already been referenced in the discussion above, more specific examples of their usefulness are provided here and in the case discussions.

1. **The listing of mitigation commitments** (in the FEIS and ROD) was seen not only as an important element in EIS disclosure and implementation, but in one case such commitments **actually enhanced the agency's ability to carry out mitigation actions.** The best example came from the MassPort Planning Director who indicated that the comprehensive EIS discussion of needed mitigation and the precise listing of committed-to mitigation actions gave MassPort staff much needed support when arguing for mitigation funding from Massport's Board. The listing of specific commitments created an indirect but politically explicit burden to comply and helped disolve the apparent interest among some Board members to underfund mitigation measures.

2. **The centralizing of authority over mitigation implementation** was also seen to be an important ingredient in mitigation. In both the Bird Island Flats and Barnstable Municipal Airport cases, one person has primary responsibility for enacting the EIS mitigation provisions. As a result there is a well defined nucleus of supervision which appears to influence the follow through and level of commitment to the EIS-prescribed mitigation program.

3. **Community involvement**: Mechanisms for involvement in determining mitigation measures by affected parties were also seen as beneficial to the overall mitigation effort. Again, both the Barnstable and Bird Island Flats cases provide good examples: at Barnstable a local advisory committee was formed through a federal noise abatement study grant to consider and recommend noise mitigation mesures. At BIF, local interest groups in East Boston were provided regular updates and copies of monitoring reports on noise, air quality and construction progress. Such committees bring more people into the mitigation process, elevating the standard of agency accountability and providing opportunities for long term participation in issues raised during the NEPA process.

4. **Encouraging "multi-purpose" mitigation where applicable.** In some cases, project specific mitigation needs served as a catalyst in leveraging region-wide or site-wide mitigation programs due to threshold impacts in areas such as noise attenuation, traffic congestion, air quality or water quality monitoring. This leveraging and linking of mitigation actions considerably expanded the coverage and scope of mitigation efforts and, consequently, tended to make them part of ongoing operations as opposed to one-time efforts of short duration.

5. **Establishing clear channels of communication** is an obvious, but sometimes overlooked mitigation technique for reducing confusion during implementation. By notifying interested parties when mitigation has begun, milestones or significant changes in the effort, and when mitigation is completed both trust and information are conveyed. This is especially useful for monitoring programs where data and information must be systematically compiled anyway. For example, communication was lacking in the Woonsocket case, where the state transportation and environmental agencies ignored each others informational needs over the progress of mitigation.

6. **Provide examples of good mitigation:** EPA may want to organize a file with specific examples of satisfactory mitigation under both substantive and "organizational" categories. Excerpts from DEIS or FEIS that provide well organized technical discussions on mitigation, attention to administrative feasibility or provide for clear comparisons across each alternative may be useful to distribute to preparers in some circumstances.

V. Case Discussions, Recommendations and Tables

CASE STUDY #1

BARNSTABLE MUNICIPAL AIRPORT
Barnstable, MA

The expansion of runway and instrumentation facilities at the Barnstable Municipal Airport (BMA) was the subject of NEPA review under the lead jurisdiction of the Federal Aeronautics Administration (FAA). The airport consists of roughly 600 acres, 14 acres in the town of Yarmouth with the remainder in the town of Barnstable. As stated in the final EIS, the project's purpose is "to increase the accessibility and reliability of Barnstable Municipal Airport--especially by extending its coverage to poor visibility or high crosswind conditions..." and to address "...the Airport's current inability to serve some of the traffic demands made upon it."

The final EIS and Record of Decision was completed in December of 1985 with an extensive list of mitigation proposals and commitments. The primary environmental concerns identified in the scoping process and addressed in the DEIS and FEIS were noise impacts from increased air traffic, contamination to existing drinking supply wells from hangar and runway runoff, impacts on sensitive wetlands and rare plant communities, and adverse effects on traffic patterns surrounding the airport. A crucial factor is that the airport site sits on a an EPA-designated sole source aquifer, the only drinking supply for the town of Barnstable and the site is also adjacent to several sensitive kettle hole ponds containing rare plants and habitat.

On one hand, the completion of EIS mitigation measures at the Barnstable Airport could be considered premature due to funding delays by FAA and subsequent delays in runway construction. After almost four years, construction only began in earnest this spring and summer (1989). As of July, according to the Airport Manager, only "70% of the area" had been cleared and grubbed prior to paving operations. The drainage control systems to cope with runway and hangar runoff had also just been installed. On the other hand, it is already apparent that some aspects of the mitigation agreement have proceeded admirably, such as an FAA- approved Part 150 Noise Study, while other mitigation measures such as a widely-endorsed groundwater monitoring program have been sluggishly implemented since completion of the final EIS.

This case represents the best example within this report of how softly-pedalled mitigation measures in the EIS--measures that lack specific schedules or oversight--add up to spotty implementation. This problem was most evident in the water quality and vegetation protection aspects of this project. Certainly many priority measures were adhered to such as underground storage tank replacement, installation of hydrocarbon separators and other drainage control measures.

Other stated intentions, however, such as the high EIS-priority

upgrading of the airport sewer system, the startup of a detailed groundwater monitoring program and certain vegetation management agreements have been only partially addressed. This appears to be due principally to vague sequencing and coordination of certain actions, unrealistic funding availability, and outright disagreement over a few measures.

Another apparent issue was that certain measures did not take into account existing infrastructure limitations. For instance, despite the high priority placed on sewer upgrading, Barnstable's current treatment plant--according to a Massachusetts DEP official--has a severe overcapacity problem and should not receive any additional flows. Another EIS mitigation measure stipulated that BMA would encourage and provide bustops at the terminals. There is, however, no regular bus service to the airport. While these examples arguably may not change the general environmental complexion of this project, they create a misleading impression within the EIS over what impacts will be addressed.

The most encouraging component of Barnstable's mitigation program was the attention paid to noise. Using an FAA Part 150 Noise Study and input from a locally-organized "noise advisory committee", eleven out of twelve specifically recommended noise-minimizing procedures were adopted and are being practiced. The outlook for continued attention to noise concerns appears strong due to the recent appointment of an "environmental specialist" whose primary expertise is in noise abatement and who expects more noise control money from FAA by the end of the year.

Not surprisingly, there is consternation among state and local officials over to the Airport's current and future impacts on water quality. The local fire district which controls well fields and next to and underneath the project was upset by erosion impacts from construction. One regional state water quality official called the wastewater treatment situation "embarrassing" and was worried about the incidence of heavy metals and organics beginning to show up in groundwater plumes within the airport's drainage pattern. An official of the local Barnstable Conservation Commission noted the Commission's disappointment with BMA's drainage plan (which they barely approved on a split vote) and BMA's apparent clearcutting next to the runways which was explicitly discouraged in the FEIS. There has also been one local enforcement action regarding sediment plumes from runway construction.

And despite a well researched, independently prepared groundwater protection strategy completed in 1987, little movement seems to have been made on the water quality monitoring provisions recommended in that report. Both the local Board of Health and Fire District were worried about not receiving any monitoring reports or data and wondered whether the planned monitoring wells had been drilled yet. Encouragingly, the fire district and BMA have signed a binding stipulation regarding sampling and monitoring provisions; the district supervisor is concerned however that he may eventually have to activate the legal clout of the stipulation.

Some mitigation measures also appear to have gotten "lost in the shuffle." For example, a progress report on mitigation was supposedly to be submitted within one year of an approval of the new airport layout plan. Although the new plan was approved--the result of the original airport expansion request--no such report was ever conducted to the knowledge of airport officials.

Finally, it should be noted that a useful distinction between project and non-project related measures was made for water resources issues in the mitigation program. This breakdown served a couple of purposes: 1) it highlighted the cumulative effects of expansion on natural resources and certain airport facilities, 2) it helped illustrate what measures were of priority since the scope of the needed measure was better defined.

Specific Notes & Recommendations from Case #1:

1. Mitigation measures should be tailored to a realistic assessment of current and future infrastructure capacities, particularly if they have the potential to substantively affect successful implementation. (While such analysis is certainly required and encouraged by CEQ regulations, the link between infrastructure conditions and mitigation completion may not be readily apparent unless discussed under implementability.)

2. The separate listing of "project" and "non-project" related mitigation measures is a useful distinction especially in recognizing cumulative impacts. (see discussion above)

3. Mitigation is often an expensive proposition. Where certain mitigation actions are dependent on future funding, this should be acknowledged and EPA should press, perhaps, for a discussion of contingency mitigation measures if funding needs are not met or if the measures are not in place within a certain time frame. For example, while daytime noise limits (82 dba takeoff, 90 dba arrival) were established in the FEIS, the airport is still waiting for money to purchase noise measuring equipment.

4. Several smaller points deserve recognition:

a. The ROD included some confidence-building language that "future grant requests" by the airport to FAA would be dependent on mitigation performance (although the frequency of monitoring is unclear.)

b. While it is a frequent statistical procedure, few mitigation measures employ "sensitivity analysis" in their comparison of mitigation measures. This appeared to be an important and useful decision criteria in the noise abatement program.

c. The Barnstable Case had the widest spectrum of project alternatives, (nine) of the four cases. This allowed for a comprehensive EIS review and more believable preferred alternative.

BARNSTABLE MUNICIPAL AIRPORT

PRELIMINARY SUMMARY OF MITIGATION
July, 1989

Runway and instrumentation expansion project
Lead Agencies: Barnstable Municipal Airport Commission
and Federal Aviation Administration

Final EIS and Record of Decision completed in December, 1985

Primary environmental impacts addressed in mitigation:

- airplane noise
- water runoff and sole source aquifer protection
- wetlands and vegetation
- traffic congestion

STATUS OF MITIGATION:

1 = completed on time, "effective"
2 = completed after EIS schedule, "effective"
3 = completion expected or now under construction
4 = effectiveness uncertain or questionable
5 = ongoing mitigation
6 = insufficient info.

OTHER FACTORS:

		Awaiting Funding	Unclear Provisions	Lead Agency Disagrees with Mitig. Measure	Other Comments
1. NOISE:					
FAA Part 150 Study: listed below are FAA "approved measures" within proposed Barnstable Airport Noise Abatement Policy:					
1. Formation of noise advisory committee	1				
2. Establishing preferential flight tracks, "controlled flight paths"	1				
3. Minimum VFR altitudes	5				1000' VFR required by FAA
4. Manufacturer's recommended noise abatement procedure	5				Required by FAA
5. Preferential runway program	5				
6. Nighttime touch-and-go prohibition	5				
7. Daytime noise limit of 82 dba at takeoff and arrival limit of 90 dba for any operator conducting more than 6 operations per month	3	X			Has not received $ to purchase noise measuring equipment yet
8. Nighttime noise limit for turbojet or transport aircraft	5		X		
9. Intersection takeoff prohibition	4			X	Agency believes this is unnecessary

10. Add a 10' to 12' attenuation wall to existing earth berm surrounding runup pit	3		X	Agency will do it, questions need
11. Nighttime maintenance "runup" hours and potential rules for violations	5			
12. Hiring of a noise abatement officer	2			
13. Noise abatement signs on runways, taxiways, and and fuel docks	1			
14. Pilot education	5			
15. Purchase of noise measurement equipment	3	X		Expect to be available this fall
16. Initiate complaint response program	2			BMA uses standardized form for complaints
17. Track changes in noise impacts	5			
18. Update noise exposure maps at least every 5 years	3			Can't do until noise readings are available
19. Annual noise report	3		X	

II. WATER, WETLANDS, & VEGETATION:

1. Install: sanitary sewers & drainage lines	4 & 6			
2. New underground fuel storage tanks	2			
3. Permanent water quality monitoring program, to be implemented by BMA	4		X	"Plan" completed but little implementation
4. Use of trapped manholes with overflows to leaching basins	2			
5. Slight crown on runways to encourage runoff	3		X	
6. 4 to 6 inches of topsoil on runoff areas	3			
7. Four new hydrocarbon separators around refueling and maintenance areas	1	X		
8. Access to ponds for pumper trucks and oil booms	1			Ignored
9. Development and implementation of vegetative and wildlife management plan	4		X	
10. Selective clearing in scrub oak/pitch pine areas	4		X	Strong 3rd party concern

11. No herbicides or pesticides on runway areas	1 & 5			
12. No mowing in grass areas between April and July where periodic mowing is required too allow for bird nesting	4		X	Vigorous agency disagreement
13. Winter clearing is preferable to wildlife	4	X		
III. TRAFFIC:				
1. Signalization at Rte.132 and Independence Drive	1			
2. Town acquisition of Independence Drive and Attucks Way	4	X		
3. Improved signing at airport entrances and within	2			
4. transit service to airport, establish bustops within the terminals	4			
5. BMA shall contact and encourage area hotels to provide shuttle service to the airport	6			
IV. CONSTRUCTION IMPACTS:				
1. BMA to submit a "progress report" on above mitigation aspects within one year of approval of Airport Plan	4	X		Appears to be forgotten

CASE STUDY #2

WOONSOCKET INDUSTRIAL HIGHWAY - ROUTE 99
Woonsocket, R.I.

The Woonsocket, Rte. 99 highway project in northeastern Rhode Island has had an unusually long and controversial history. Originally proposed in 1970, this 3.3 mile bypass has been steadfastly endorsed by the Federal Highway Administrations (FWHA) and the Rhode Island Department of Transportation (RIDOT) as a necessary link between Interstate 295 and designated industrial growth areas in the town of Woonsocket. The road is also intended to relieve congestion on existing roads.

Route 99 was among the first generation of NEPA statements completed; the original FEIS was issued in December of 1971. The NEPA process, however, was reopened and continued for another fifteen years due to permitting issues, eminent domain proceedings and funding delays. A draft supplement that evaluated two other alignments was issued in 1977, the Federal Highway Administration re-approved the original project selection in 1980, and as the project appeared to approach start-up, a water quality certification and wetlands permit was issued by the state in 1984.

Then in 1985 the Army Corps of Engineers and EPA voiced objections over the inadequacy of earlier impact statements during the federal 404 wetlands permitting process. It was decided once again to reopen the NEPA process in order to prepare a Supplemental EIS. This led to a draft supplemental in early 1986 and a final supplemental in October of 1986. As of the summer of 1989, the first phase of project construction, approximately 3 miles of paving and related sitework, is just reaching completion in the summer of 1989.

From the start, two difficult issues clouded the reconvened 1986 NEPA process. One problem pitted federal and state highway agencies against EPA, the Corps and other parties over the proper balancing of so called 4(f) lands (49 USC §303) which pertain to historic sites and structures. The Federal Highway Administration argued that their administrative procedures concerning 4(f) lands, superceded the NEPA review of environmental impacts. Other agencies, including EPA, believed that environmental amenities had equal footing in the alternatives analysis.

A second, less negotiable issue, involved the pattern of condemnation prior to the 1985 decision to supplement the existing impact statement. Before 1985, 45 houses and business lands had been acquired in expectation of building along the 4(b) alignment, the route long preferred by RIDOT and the FHWA. Other alignments would have required a fresh round of controversial and costly eminent domain proceedings.

These two issues in many ways preempted the available mitigation options; especially the threshold test of avoidance under NEPA. At one level, the transportation agencies argued that protection of 4(f) properties supplanted environmental concerns; at another level, the extensive takings for the 4(b) alignment created economic and legal reliances that prevented an unfettered discussion of alternatives under NEPA. The opportunities for mitigation were thus largely reactive and prescriptive rather than preventive.

Nevertheless, several comprehensive mitigation measures were adopted due to the fact that the new road bisected the primary drinking supply watershed of the town of Woonsocket. A closed drainage system that diverted roadway runoff away from the watershed to the nearby Blackstone River was required along with vigorous erosion control measures such as snow berms, tree planting, and silt fencing. The loss of 7.2 acres of wetland was to be mitigated through an extensive replacement program involving the construction and maintenance of three separate wetland areas with various functions to be served by each.

The Woonsocket case provides a good example of how mitigation can go awry as a result of poor communication among agencies and confusion over permitting standards and enforcement duties. In one instance the state environmental agency was spuriously alarmed when they arrived to find one of the wetland replacement areas temporarily pumped dry in order to allow placement of wetland soils; this action was planned by RIDOT but the agencies rarely talked to each other.

In another example, the communications surrounding erosion control monitoring were muddled. As a result, incidences of erosion from construction, usually after rainstorms, provoked irritation among local water supply district officials who had trouble anticipating "turbidity shocks" in the municipal reservoir. This was complicated by the district's assertion that neither the state transportation or environmental agencies were responsive to the problem, willing to cite violations or even acknowledge at times that problems existed.

RIDOT acknowledges some of the erosion problems and notes that their usual procedures for soil exposure--originally designed for mofifications of existing roads rather then new roads--had to be altered during construction. RIDOT did, however, fine their contractor on three occasions although they did not notify other agencies of these penalties.

The linchpin of the water quality protection program was the closed drainage system which was slated to be among the first segments completed. Ironically, seasonal prohibitions on excavated materials storage in nearby wetland areas delayed timely completion of this system; a situation which further exacerbated erosion and anguish among local water officials. Apparently the interaction of wetland and erosion mitigation measures were never considered.

Another communications problem arose as RIDOT and their consultants attempted to sort out differing wetland standards required by various environmental agencies. Although wetland replication appears to be generally successful, the regulatory overlap between the Corps, the Department of Interior, EPA and state wetland agencies was claimed to have caused confusion for RIDOT, particularly since they had had little previous experience with large-scale wetland replication.

Specific recommendations from Case #2:

1. For mitigation actions where various standards may conflict, such as in wetlands mitigation, an effort should be made in the early stages of EIS development to gain consensus on the appropriate method or set of standards to be applied in mitigation. For wetlands especially, effective replacement of functional values seems to strongly depend on which evaluation model is used.

This issue might best be worked out by a separate representative committee that attempts to stipulate (within or outside the NEPA process) the methodology for implementation and the standard of review for assessing compliance.

2. This case demonstrates the usefulnees of determining whether an agency has previous experience commensurate with the mitigation actions being proposed. While the problems incurred in the Rte. 99 project were generally correctible, it was apparent that RIDOT was not used to complying with demands like turbidity monitoring, new erosion control needs, reconciling various wetland standards, or working to keep other parties informed. Again, this reflects the importance of idnetifying feasibility. If EPA can recognize similar situations in the future then it may help to provide the lead agency with examples of procedures or projects that EPA believes have worked well for comparable mitigation needs.

3. As in other NEPA cases, there was a tendency in the Woonsocket FEIS to avoid a detailed discussion of mitigation actions for each alternative. Project engineers argue with some credibility that it is economically burdensome to get specific about mitigation design for certain measures until they have reasonable certainty about the acceptability of a project alternative selection.

The dilema is framed as a "design versus designation" issue; some contend that designation of mitigation techniques or methods is more appropriate at the EIS stage rather than detailing working designs of actual mitigation measures. This approach prefers leaving the nitty-gritty detail work to the regulatory stage, which in turn leaves discretion for implementation to permitting agencies and an opportunity to avoid addressing implementation in the EIS.

According to transportation officials, two incentives for non-specificity of mitigation in an EIS arise when a 404 or similar review is required in the permitting stage. One generic issue is

the uncertainty that an "acceptable" EIS review may not necessarily be acceptable in the permitting stage, ("...the NEPA reviewers are a different bunch than the regulators...") A second issue concerns the NEPA-style alternatives analysis necessary to receive a 404 permit, a process which invites costly duplicative outlays. Transportation officials emphasize that more effort would go into NEPA if they "didn't have to do it twice."

While CEQ regulations emphasize that appropriate mitigation must accompany each alternative in an EIS analysis, there is clearly a line that must be established in each case over what constitutes a sufficiently detailed mitigation discussion. A strong indicator that helps determine where the informational line should be is the availability of baseline data. EPA should strive to make a distinction in EIS reviews between feasibility that is pegged to **future** monitoring--as the measure is implemented--versus the feasiblity of mitigation measures that are tied to a strong understanding of baseline conditions. This is a special concern in water resources protection.

The lack of upfront data can encourage undue optimism. In these situations EPA should request a more strenuous examination of EIS-proposed mitigation. On the other hand, where strong baseline data is available, deferral to a permitting program may be more appropriate. The reasons for deferring, however, should be made clear in the EIS, needed permit conditions should be considered or recommended, and the probability of implementation should be clear.

WOONSOCKET INDUSTRIAL HIGHWAY - Rte. 99

PRELIMINARY STATUS OF MITIGATION
July 1989

Transportation link to the town of Woonsocket
Lead agencies: Federal Highway Administration and
Rhode Island Department of Transportation

Final EIS and Record of Decision completed in January 1987
(Mitigation measures for historic sites are outlined in
an MOU between FHWA, RIDOT and local agencies)

Primary environmental impacts addressed in mitigation:

- wetlands protection and replication
- impacts to municipal drinking supply
- impacts to historic sites
- noise and air quality

STATUS OF MITIGATION:

1 = completed on time, "effective"
2 = completed after EIS schedule, "effective"
3 = completion expected, or under construction
4 = effectiveness uncertain or questionable
5 = "ongoing" mitigation
6 = insufficient info.

OTHER FACTORS:

		Awaiting Funding	Unclear EIS Provisions	Lead Agency "Disagrees" with Mitig. Measure	Other Comments
1. WETLANDS AND WATER QUALITY PROTECTION:					
Short term measures:					
1. Erosion and sedimentation controls, seeding and mulching of side slopes	3 & 4				
2. construction activity in sensitive areas limited to "low flow conditions"	4		X		
3. Stockpiling and containment of excavated materials	3		X		
Long term measures:					
1. Development of 3 compensatory wetlands and flood storage areas in drinking watershed within two growing seasons	1				
(1) Area A	1				
(2) Area B	4				
(3) Area E	1				
2. multiple culverts at selected stream crossings to maintain existing hydrological regime	1				
3. Construction of a closed drainage system	3				

4. Construction of impervious berm along roadway	2		
5. High profile plantings to minimize aesthetic impact	3		
6. preservation of existing 5.8 acre wetland	6		
7. Enhancement of a "degraded wetland" along the Blackstone River	6	X	
AIR QUALITY:			
1. Intersections operate at level of service C or better	5		
NOISE:			
Note: Mitigation for Noise is listed in the EIS as actions which are "feasible" rather than measures to be implemented			
1. Noise barriers west of route 122 to shield homes 8 dBA reduction	4		X
2. Noise barriers on north side of Woonsocket Industrial Highway in the vicinty of the Rte. 122 interchange	4		
HISTORIC SITES:			
1. design of bridge over Blackstone Canal district to be as "compatible as possible with its setting"	3		
2. photo-documentation of area prior to construction	1		
3. natural landscaping to decrease visual impacts	3		
OTHER CONSTRUCTION IMPACTS:			
1. Prohibit "noisy operations" during nightime hours	5	X	
2. require that construction equip have properly functioning mufflers	6		
3. avoid use of local streets by construction vehicles	6		

CASE STUDY #3

BIRD ISLAND FLATS - LOGAN INTERNATIONAL AIRPORT
Boston, MA

The Bird Island Flats development sits on the western edge of a 234 acre fill project created in 1974 within the boundaries of Logan International Airport on Boston Harbor. The Massachusetts Port Authority (MassPort) and the Federal Aviation Administration (FAA) intended to use this parcel to accomodate Logan's rapidly expanding cargo transport, commercial storage and runway needs, however, flight safety regulations limited the developable parcel to approximately 95 acres. A draft environmental impact statement was prepared in April 1980 and a final impact statement was issued in November of 1980. A supplement, however, was required under the state of Masachusett's environmental review process; a Record of Decision on the entire project was not issued until August of 1981.

Of the four cases reviewed in this report the BIF development, and MassPort as a lead agency in particular, stood out as a project which handled mitigation in a serious and comprehensive manner. This resulted from several factors: the staff and financial resources available at MassPort, extensive community involvement and scrutiny by the adjacent towns of East Boston and Winthrop, and the linkage of mitigation with several existing problems at Logan which demanded attention such as traffic congestion and air quality concerns.

Tracking mitigation compliance in this case proved to be the easiest of the four cases due to a clear and organized approach by MassPort towards the mitigation measures it had committed to. The Record of Decision is exemplary for readability and a clear listing of mitigation commitments and conditions which belong in regulatory decisions. An additional factor is assessing mitigation had to do with the comparatively long time period since the project was constructed in the early 1980's. Unlike the other three cases, there was ample room for hindsight.

Especially admirable in this case was MassPort's ability to overcome a deeply rooted suspicion toward further airport development held by local government and community groups due to the airport's previous impacts on neighboring residential areas. In a unique move, MassPort provided substantial funds to community groups to hire their own noise and air experts to evaluate and rebut the data generated by MassPort.

The same environmental problems that concerned the neighbors before--noise, dust, traffic congestion and bad air--were to be repeated, only at a more intensive level without appropriate mitigation at the Bird Island Flats proposal. It was recognized early in the NEPA process that mitigation could not simply consist of local "band-aid" measures; fundamental environmental issues had emerged with the growth of Logan as a major international airport.

While several approaches to confront existing problems had been urged and discussed for years under Logan's own master planning process, NEPA review for the BIF project was clearly the catalyst for gaining serious attention to these issues. But the mitigation program developed for BIF was not simply a quid pro quo to allow airport expansion; development of the Flats could clearly exacerbate several well understood problems.

Thus from the start, the BIF project was linked to an overall review of airport operations rather than site-specific issues. From this perspective, MassPort, with the assistance of state and federal agencies, surveyed and implemented long-term, strategic mitigation actions such as fuel storage and vapor recovery systems, employee commuting programs, airport traffic flows and the use of mass transportation.

Discussions with community group and local officials ascertain a general high level of satisfaction with the mitigation program at BIF. One city conservation commission official noted some concerns over stormwater runoff from one portion of the tarmac but also indicated that they expect Logan will correct this problem soon. A community group director of the East Boston Neighborhood Association lauded MassPort's effort to keep them apprised of construction progress, mitigation implementation and air quality reports.

Two other factors appear to have contributed to mitigation performance here. One is the important recognition of MassPort officials as to the role of NEPA; a tool for gaining both understanding of probable impacts and consensus on their resolution rather than an obstacle to progress. A second factor was the presence of a crucially important political dynamic: a broad constituency of government officials and community interest was created through the NEPA process that translated into specific commitments and a political "lien" on MassPort to comply with and mobilize a mitigation program.

This dynamic was more visible here than in the other cases. It was due perhaps to geographical elements since Logan is within visual distance of all the major state and federal agencies having jurisdiction. It was also due to the scale of the project; airport operations, traffic congestion and air quality issues extend well beyond airport property lines into densely populated areas. In short, a "big neighborhood" of regulatory and residential interests had to sign off on the project.

Specific recommendations from Case #3:

Several positive aspects of the mitigation effort at BIF have been mentioned. In light of more basic problems experienced in the other cases it is hard to get too critical of the BIF project. Thus a summary of other important features is provided:

1. Regular communication to affected groups during implementation was seen as important. While MassPort apparently did this voluntarily, it is an action which EPA may encourage lead agencies to build into their discussion of implementation or monitoring provisions.

2. For mitigation measures that are uncertain or untried, EPA may want to encourage NEPA discussion on contingency measures, again as part of implementation. For example, as part of the effort to increase usage of mass transportation, Massport promised to examine the feasibility of one-way tolls and ferry service between Boston and Logan. Both these measures were permanently activated after experimental programs. In another example, Massport committed to retaining a 25-cent fare for airport shuttle service, however they eliminated the fare altogether to further promote shuttle usage. Massport's willingness to expand on mitigation efforts that worked was an unique feature of implementation.

3. EPA may want to encourage that an ROD supply, in addition to a detailed discussion on mitigation commitments, a one-page summary of mitigation measures as MassPort did under the state environemntal review process. This is a very useful and handy reference for projects that involve extensive mitigation; it allows third parties to keep track of the measures to be implemented. (See attached copy)

SUMMARY OF MITIGATING MEASURES TO WHICH MASSPORT IS COMMITTED FOR BIRD ISLAND FLATS

As Given in the FEIR and RFEIR

1. "Active noise buffer" site plan for mixed use development.
2. North-south orientation of westernmost cargo building as noise shield.
3. Towing of aircraft to reduce ground noise.
4. Study of freight forwarder activities and support for related planning for traffic and land use impacts.
5. Temporary noise barrier along airport service road used by construction vehicles.
6. Temporary truck access route.
7. Fugitive dust control measures at construction site.
8. TSP monitoring during construction.
9. HC vapor recovery emission controls at fuel storage and handling facilities.
10. Long term NOx monitoring program and environmental audit of air carrier schedule changes.
11. Strengthened regulations for aircraft engine noise under Federal standards (CFR Part 36).
12. Design Review and Advisory Committee for site planning and building design.
13. Roadway improvements:
    a. U-turn connecting outbound to inbound airport road.
    b. "Jug-handle" for left turns from airport road inbound to crossroad northbound.
    c. New routing for traffic on outbound airport road destined for crossroad southbound.
14. "Logan Commuter Plan" ridesharing program:
    a. Ride matching, marketing, and problem resolution.
    b. Vanpool subsidy.
    c. Preferential parking for carpools and vanpools.
    d. Encouragement of employee payroll deductions for MBTA pass program.
15. Requirement for 50% subsidy of employee MBTA passes by Bird Island Flats employers.
16. Increased employee parking fees.
17. Limited parking at Bird Island Flats, with higher rates for single-occupant vehicles than for carpools and vanpools.
18. Use of Wood Island parking lot for remote employee parking.
19. Staff support for potential operators of bus and limousine service.
20. Commitment to retaining ~~25¢~~ fare for airport shuttle bus.
21. Commitment to providing transit service between Bird Island Flats and other Logan area points.
22. Study of possible ferry service between downtown Boston and Bird Island Flats.
23. Variable work hours program for Bird Island Flats employees.
24. Traffic monitoring program for Logan and vicinity.

LOGAN AIRPORT: BIRD ISLAND FLATS DEVELOPMENT

PRELIMINARY SUMMARY OF MITIGATION
July 1989

Expansion of cargo, runway and commercial facilities
Final EIS and Record of Decision completed in November 1980

Lead Agencies: Massachusetts Port Authority, U.S. DOT and
Federal Aviation Administration

Primary environmental impacts addressed in mitigation:

- noise control
- air quality degradation
- traffic congestion

STATUS OF MITIGATION:

1 = completed on time, "effective"
2 = completed after EIS schedule, "effective"
3 = completion expected or now under construction
4 = effectiveness uncertain or questionable
5 = ongoing mitigation
6 = insufficient info.

OTHER FACTORS:

		Awaiting Funding	Unclear EIS Provisions	Lead Agency "Disagrees" with Mitig. Measure	Other Comments
NOISE:					
1. Active Noise buffer site plan for mixed use development	1				
2. North-south orientation of westernmost cargo building	3				
3. Towing of aircraft to reduce noise	4 & 5		X		
4. Study of freight forwarder activities	6		X		
5. New federal regulations for aircraft engine noise (CFR Part 36)	1				
AIR QUALITY:					
1. HC vapor recovery controls at fuel storage and handling	1				
2. Long term NOx monitoring program and audit of air carrier schedule changes	1 & 5				
TRAFFIC:					
1. Roadway improvements:					
a. U-turn connecting outbound to inbound airport road	1				
b. "jug handle" for left turns from inbound airport road	1				
c. new routing for traffic on outbound airport road	1				

2. "Logan Commuter Plan" ridesharing program:				
a. ride matching	4			This plan was never accepted by employers and there were other problems in implementing
b. vanpool subsidy	4			
c. preferential parking for carpools and vanpools	4			
d. encourage payroll deductions for MBTA pass program	4			
3. Require 50% subsidy of employee MBTA passes by BIF employers	4		I	Not accepted by airport employers
4. Increased employee parking fees	1			
5. Limit parking at BIF, higher rates for single-person cars	4		I	
6. use Wood Island parking lot for remote employee parking	4			strong neighborhood opposition
7. support for potential operators of bus and limo service	1			
8. Retain 25-cent fare for airport shuttle bus	1			eliminated 25 cent fare to increase usage
9. provide transit service between BIF and other Logan areas	5	I		
10. study of ferry service between BIF and downtown Boston	1			implemented after study
11. variable work hours program for BIF employees	5	I		
12. traffic monitoring program for Logan and vicinity	5			
13. analysis of North Station exit ramp closing	4		I	
14. Experimental one-way tolls on Sumner-Callahan tunnels and Mystic Bridge	1			implemented after study
15. Eliminate access to airport from Porter and Maverick street	6			
GENERAL MEASURES:				
1. Design Review and Advisory Committee for site planning	1 & 5			
CONSTRUCTION IMPACTS:				
1. Temporary noise barrier along airport service road	1			
2. Temporary truck access route	1			
3. Fugitive dust control measures	1			
4. TSP monitoring during construction	1			ongoing after construction

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CASE STUDY #4

ROUTE 25 HIGHWAY EXTENTION
Plymouth, Bourne and Buzzards Bay, MA

The Route 25 connector in southern Massachusetts is a seven mile six-lane addition designed to link the existing Interstate 495 with Route 6 on Cape Cod to facilitate easier access to the Cape and to alleviate congestion in Buzzards Bay. The lead agencies, the Massachusetts Department of Public Works (MDPW) and the Federal Highway Administration (FHWA), initiated the NEPA process in the late 1968 and published a final environmental impact statement in February of 1978.

This statement was then appealed to U.S. District Court by local interest groups; the Court determined that the EIS did not fulfill NEPA's procedural requirements for a "detailed discussion" of reasonable highway alignment alternatives. The Court ordered a Supplemental EIS to be prepared that looked at the unexamined "Upland Alternative" and to provide more detailed information on the MDPW's preferred alternative, the "Easterly Alternative."

A draft Supplement was offered in 1982 in which two new alternatives were reviewed, the Upland Alternative and the Modifed Upland Alternative. After extensive public comment the final Supplement to the FSEIS was completed in August, 1983; the Supplement determined that the "Modified Upland Alternative" was now the most desireable alignment.

Besides the lawsuit, considerable public pressure was brought to bear on MDPW to reject the Easterly Alternative. This alignment would have bisected a working farm and created more extensive runoff and wetland impacts than the Modified Upland Alternative. The popular support for the modified alignment was also held by several state and federal agencies, including EPA.

Although long and costly, the tangled history of the Route 25 project is a good example of how NEPA's fundamental evaluative and informational role led to a more environmentally sound project with greater public support. The project also illustrates the practical benefits of utilizing avoidance as a precursory mitigation technique once the impacts from each alternative can be analyzed and compared.

As discussed in the introduction, the principle of avoidance of environmental harm, while not a central focus in these cases, is fundamentally connected to the fate of mitigation measures employed in the selection of a preferred alternative. The Route 25 case appears to be a good example where avoidance led to more feasible mitigation efforts and ultimately a more environmentally benign project for two reasons: one, because there was "less harm" to mitigate, and secondly, the resulting mitigation measures were less

cumbersome and costly than they would likely have been otherwise. The modified upland alternative involved less acreage in wetland loss, less direct water quality impacts from runoff and less disruption to commercial farming activities. And it was clearly public input received through NEPA that exposed the flawed analysis and uneccesary environmental problems that would have been created under the original design.

In addition, one can well argue that if MDPW and the FHWA had considered a full range of more environmentally acceptable project alternatives at the outset--with a particular eye towards maximizing avoidance of environmental harm--considerable expense, delay, and litigation involving many parties would have been avoided as well.

The primary impacts resulting from the selection of the Modified Upland Alternative continued to be water resource related since the road runs through low lying boggy areas just a few miles north of the ocean. The natural hydrology of this area has already been considerably altered by pumping for drinking water supply and the extensive network of levees, dikes and holding ponds created by the region's commercial cranberry growers.

Hence, mitigation focused on surface water runoff from de-icing, hydrocarbon spills or other highway substances, the potential for groundwater contamination, and wetland replacement. Secondary issues involved noise impacts to neighboring farms and residences.

As of this time, it appears that water quality degradation has not been problematic due to strenuous stormwater and drainage measures. A "closed drainage system" to prevent uncontrolled runoff was utilized with two outfalls, an ocean discharge into the Cape Cod Canal and a discharge into a sediment and retention basin which eventually percolates into groundwater. The drainage system also includes "snow berms" running paralıel to the road to direct and contain water in semi-permeable ditches and to prevent contaminated snow from leaching into adjacent water systems.

A major issue in this case centered on the appropriate degree and design of mitigation for wetlands loss. A thirteen-acre wetland replacement site was selected adjacent to the highway where the road displaced several active cranberry bogs. Considerable expense went into excavating, planting and fencing a new wetland site in accordance with state requirements for a functional "shallow marsh" wetland.

A cranberry farmer, whose bogs were taken through eminent domain by MDPW, has repeatedly and unsuccessfully tried to gain access to the newly replaced wetland to use for cranberry growing. He and his consultants maintain that all of the wetalnd values sought by the state can be served by the cranberry bog because they can assure a steady supply of water to the new site. The state argued, however, that the wetland should not be devoted to "monoculture" wetland uses and that the farmer was already justly compensated

(apparently several hundreds of thousands of dollars) under eminent domain proceeedings.

This controversy has produced several state level administrative appeals around questions of what types of wetlands the state should be managing, the wetland values of cranberry bogs versus conventional wetlands, and the functional attributes of replaced wetlands versus naturally occurring wetlands. Added to this controversy is doubt by some state officials that the new wetland is actually fulfilling all of the values intended for a shallow marsh wetland even though it currently meets the state's criteria of containing at least 50% hydrophytic plant cover.

Specific Recommendations from Case #4:

1. EPA should stress the concept of avoidance-as-mitigation early in the development of environmental documents. While this may seem an obvious element of the current process, it is important to remember that EPA plays an important educational and watchdog role in the orderly preparation of impact statements under NEPA. Avoidance must be emphasized not only because certain indisputable damages can be averted, but also because the resulting project becomes less dependent on more complex mitigation needs.

2. EPA should consider requesting wetland mitigation commitments that explcitly indicate the functional wetland characteristics being sought such as water purification, habitat protection, flood control, etc.. This may help focus the discussion on what values are being lost by a new project and encourage a more careful structuring of conditions in a 404 permit.

ROUTE 25 HIGHWAY PROJECT
Plymouth, Bourne and Buzzards bay, MA

PRELIMINARY SUMMARY OF MITIGATION
August, 1989

Lead Agencies: Massachusetts Department of Public Works, U.S. DOT

Final Supplement to FEIS completed in September 1983

Primary environmental impacts addressed in mitigation:

Water quality:
- drinking water supplies
- wetlands
- indirect discharges from stormwater and road salt

Other:
- noise impacts to residences and farming operations

STATUS OF MITIGATION:

1 = completed on time, "effective"
2 = completed after EIS schedule, "effective"
3 = completion expected or now under construction
4 = effectiveness uncertain or questionable
5 = ongoing mitigation
6 = insufficient info.

OTHER FACTORS:

		Awaiting Funding	Unclear EIS Provisions	Lead Agency "Disagrees" with Mitig. Measure	Other Comments
SURFACE AND GROUNDWATER QUALITY:					
1. construction of closed drainage and snowbern system	1				
2. silt screen fencing	1				
3. groundwater monitoring	5				some monitoring to be discontinued because of lab costs
4. sedimentation pools to control road salt	4				
5. stormwater carried to Cape Cod Canal	1				
WETLANDS:					
1. Ten acre wetland replacement area	4				3 year evaluation is planned
2. Replacement wetlands in redesign of Bourne Traffic circle	1				
NOISE:					
1. Noise attenuation barrier or movement of "Tucker" residence	4				Believed not to be "cost effective" in FSEIS

APPENDICES and SELECTED REFERENCES

Appendix 1

Discussion of Future Survey Models

If any result is evident from this report, it should be apparent that NEPA mitigation programs are as varied as the projects themselves. One objective in this survey was to discover the questions and contraints that confront future research on NEPA mitigation performance and consider models that might allow for an expanded, more definitive research effort. The interest, of course, is in obtaining some analytical confidence in measuring mitigation performance rather than the more vulnerable, anecdotal style of this report.

Mitigation performance does not lend itself easily to comparison and inference precisely because of the difficulty in standardizing results. The common demoninator among each case is presumably NEPA and its accompanying regulations issued by CEQ. But even here there is considerable room for interpretation at both project-specific levels and EPA regional levels; such interpretations are also modified by occasional regulatory changes from CEQ or new judicial opinions.

Three, frequently separate, areas of inquiry seemed to interact in each case. For the purposes of this report, however, the case discussions blended any clear distinction between these areas in order to provide a reasonable, but brief, overall understanding of the project.

One area addresses the attempt to evaluate what has happened to date; it asks: By what criteria do we measure whether mitigation has worked or not? A second area asks: What aspects of the NEPA process influences mitigation performance; how is information organized and expectations represented?. And a third area attempts to understand the effect of unigue project circumstances such as administrative expertise, extensive community involvement or other external factors. Each of these areas are further explored below:

1. **What is being measured?** Acertaining whether mitigation efforts have succeeded depends on how success is defined and the criteria used to measure it. The following suggest ways of gauging performance in the form of questions that might be asked of future mitigation assessments.

o Did implementation of mitigation occur on schedule?

o Is the mitigation action included in a permit program?

o Does the action currently comply with permit provisions?

o Do regulators generally agree with the content of the proposed mitigation?

o Do parties to the NEPA process generally support the mitigation action?

o Is there clear supervision or oversight for the project's mitigation program?

o Are there adequate resources, financial or administrative, to implement mitigation?

2. **What were the expectations as represented in NEPA documents for the design and implementation of mitigation measures?** This brings about a new set of questions:

o Did the action receive a "detailed discussion" of feasibility in the impact statements?

o Were there specific timelines for implementation?

o Was the needed action compared across each alternative?

o Was the action "committed to" or "adopted" in an ROD?

o Was the action discretionary or expected to be part of a regulatory program?

o Was there discussion on or comparison of costs?

o Is the action "long-term" or "short-term", does it require monitoring?

o Does the preferred alternative best represent avoidance of environmental impacts among all the alternatives presented?

3. **What project circumstances have influenced the choice and success of mitigation?** Yet a third set of questions presents itself that ask in what ways has mitigation success been influenced by unique project characteristics external to the NEPA process?

o What is the lead agency's experience in implementing the types of mitigation required for this project?

o Are there other ongoing mitigation efforts that can be joined with specific measures from this project?

o How many agencies, public interest groups were involved; was there litigation or a referral?

o How "big" is the project? ...in dollars, acres, or political interest?

o Who is aggrieved by the project, how does resistance to the project shape mitigation commitments?

There is no apparent place to begin in systematically evaluating NEPA mitigation. These lists only indicate ways of thinking about mitigation performance; they are not exhaustive. The multitude of factors that can affect mitigation performance suggest that key indices or parameters should be identified in order to come up with a cogent means of aggregating information from many NEPA projects. These parameters can then be used as a basis for statistical inference about mitigation performance.

Examples of significant parameters for the first category could be implementation time, mitigation costs, the "type" of impact being mitigated, the presence or absence of permit programs, or the number and frequency of enforcement actions.

Examples of key parameters for the second group might be the format of the ROD, the inclusion of feasibility information in the EIS, the number of EIS alternatives examined, or whether sensitivity between probable mitigation results was studied.

And finally, examples of parameters for the third category may be the number of commenting agencies, the "type" of project, or total construction costs.

These parameters should lend themselves to quantification, not necessarily as "point estimates" but rather through some form of ranking or use of ranges to allow for statistical analysis. There are several econometric and statistical techniques for converting or grouping seemingly intangible data into numerical summaries. Only through this kind of exercise can one expect to conduct any large-scale review of mitigation on a regional or national level.

Specifying and defending these parameters is a crucial and overarching task. Simply put, weak estimators lead to weak or erratic results. Correlations may be found to exist among all sorts of mitigation factors; whether they are meaningful or relevant is the important question. Specifying what is being measured and why certain parameters were chosen as indicative of mitigation performance will be an important part of any expanded research effort in evaluating mitigation under NEPA.

(VI. Appendix 2)

TO: Office of Government Relations & Environmental Review, Region 1, EPA

RE: The effects of two recent Supreme Court decisions of May 1, 1989 on NEPA procedures, (Robertson [USFS] v. Methow Valley Citizens Council and a companion decision Marsh [Secretary of the Army] v. Oregon Natural Resources Council.)

FR: Eric Palola

BACKGROUND:

Two recent Supreme Court decisions refine the obligations of federal agencies in their assessment of environmental impacts under NEPA. Requirements for mitigation in an agency's preparation of an environmental impact statement (EIS) were reviewed in Methow. The circumstances under which an EIS should be supplemented due to new information or inadequate analysis was the focus of Marsh.

Although some believe that the Supreme Court has relaxed NEPA requirements for a detailed assessment of adverse impacts and potential mitigation measures, the Court has, in fact, strongly upheld these key provisions of NEPA. The practical effect of Methow and Marsh is instead a narrow clarification of the "action-forcing" purposes of NEPA, specifically; 1) mitigation cannot be enforced through a "fully developed mitigation plan" in an EIS; and, 2) the recognition of lead-agency discretion in factual matters concerning "significant new information" requiring a supplemental EIS.

Both Supreme Court decisions arise from opinions of the Ninth Circuit Court of Appeals. In Methow, the Ninth Circuit found that the U.S. Forest Service--in its consideration of a "special-use" permit for new ski facilities in the undeveloped Methow valley of Washington's North Cascades mountains--failed, in their obligation under NEPA, to discuss necessary mitigation measures or conduct a comprehensive review of development alternatives. In Marsh, the Ninth Circuit ruled that the Army Corps of Engineers was obligated to provide a supplemental EIS for a pending dam project due to new water quality and turbidity studies and because the Corp failed to consider cumulative impacts of the dam on the river basin as required by NEPA.

The Supreme Court's opinions reflect a largely rhetorical and narrowly construed attack on the Ninth Circuit's rulings by the two federal agencies. The USFS and Corps insisted that the Ninth Circuit created new substantive burdens on federal agencies; a view that was predictably struck down given the Supreme Court's long-standing views on NEPA. In doing so, the Court strongly maintained the underlying informational, public disclosure, and action-forcing intent of NEPA.

Additionally, the Supreme Court let stand substantial portions of the lower Court's opinions; namely, the Ninth Circuit's order in Methow confirming CEQ requirements that an EIS must contain a thorough review of project alternatives and, in Marsh, the need for comprehensive analysis of off-site and cumulative impacts.

SOME QUESTIONS AND ANSWERS:

1. Does either Supreme Court decision relax NEPA requirements for full disclosure of all "reasonably foreseeable" adverse environmental impacts and mitigation measures in an EIS?

Comment: No. In both decisions, the Court underscored the intent of NEPA as a "two-way street" in the flow of information between federal agencies, the general public and other affected governmental agencies. NEPA's purpose is fundamentally to prevent uninformed decisions as indicated in Methow:

"Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented' is an understanding that EIS will discuss the extent to which adverse environmental impacts can be avoided." (emphasis added)

...and in Marsh:

"...NEPA does require that agencies take a 'hard look' at the environmental effects of their planned action, even after a proposal has received initial approval."

2. What practical effect does Methow have on the obligation of federal agencies to provide a detailed discussion of mitigation under NEPA?

Comment: The Methow decision does not excuse lead agencies from assessing mitigation needs for all adverse impacts identified in the scoping process. Agencies must detail needed mitigation measures in the EIS, assess their effectiveness, and discuss the likelihood of their implementation by identifying responsible parties and their ability to mitigate on-site and off-site environmental damages. The Court emphasized:

"To be sure, one important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences.* The requirement that an EIS contain a detailed discussion of possible mitigation measures flows from both the language of the Act and, more expressly, from CEQ's implementing regulations... omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action-forcing' function of NEPA." (emphasis provided)

The Court's primary finding in Methow was that federal agencies are not required to include, as part of an EIS, a binding, enforceable mitigation plan: "...we conclude that NEPA does not require a fully developed plan detailing what steps will be taken to mitigate adverse environmental impacts..." (emphasis added)

The content of mitigation measures--once a thorough analysis of necessary and possible mitigation actions are made--was deemed to be within the lead agency's discretion. The threshold for such discretion is based on the "reasonableness" standard. Thus, evidence that solidly refutes the adequacy of proposed mitigation or demonstrates that feasible mitigation was ignored or undisclosed in an EIS may be grounds for a procedural challenge.

* Also highlighted in a separate footnote by Justice Brennan.

3. Following Marsh, when do agencies have to "supplement" an EIS?

Comment: Marsh hinged on whether the Corps was required to prepare an additional supplement to a final EIS in light of new water quality studies on turbidity and fish mortality; studies which the Corps determined to be inaccurate and thus not "significant". In Marsh, the Supreme Court held that the Corps' decision not to prepare a supplement to a final EIS was not "a clear error of judgement" under the more deferential arbitrary and capricious standard since the Corps: "conducted a reasoned evaluation of the relevant information."

The Court, however, clearly stated that lead agencies cannot blithely dismiss relevant or credible information in deciding whether to supplement an EIS:

"There is little doubt that if all of the [new soil and turbidity studies on water quality] was both new and accurate,...the Corps would have been required to prepare a second supplemental EIS. It is also clear that the Corps... had a duty to take a 'hard look' at the proffered evidence."

4. What portions of the Ninth Circuit decisions are upheld?

Comment: The Forest Service and the Corps chose not to appeal and the Supreme Court did not address key aspects of the Methow and Marsh Circuit Court decisions which pertain, respectively, to: comprehensive examination of alternatives in an EIS; and, NEPA's requirement that cumulative impacts be analyzed.

See: Methow (833 F.2nd 810, 9th Cir.1987) and Marsh (832 F.2nd 1489, 9th Cir.1987)

In Methow, the Ninth Circuit determined that an EIS "must consider every reasonable alternative" since an EIS is "rendered inadequate by the existence of a viable but unexamined alternative." The Court also asserted that NEPA has an important "predictive" role in evaluating impacts and that studies performed subsequent to an EIS, which provide crucial information in the assessment of environmental impacts, "will not cure a deficient EIS."

The Court further emphasized that an EIS should focus on those impacts that are deemed significant regardless of whether they are of a primary or secondary nature, and that the Forest Service's purpose "...is broadly framed in terms of service to the public benefit. It is not, by its own terms, tied to a specific parcel of land."

In Marsh, the Ninth Circuit held that a final EIS required a supplement due to an inadequate analysis of cumulative impacts, irrespective of the new water quality data. Here the Court ruled that the Corps failed to estimate the effect of a new dam in conjunction with other nearby dams on the same river.

The Court noted that CEQ regulations compel the Corps to "consider cumulative impacts of the proposed actions which supplement or aggravate the impacts of past, present and reasonably forseeable actions," and, they concluded: "...although the Corps need not prepare a separate statement addressing the cumulative impact of the dams, it should supplement the statement and address the cumulative impact [of the dams]..." (emphasis added)

VIII. Selected References on Mitigation Under NEPA

1. "Questions and Answers About the NEPA Regulations" Council on Environmental Quality, 1981

2. "Draft Guidance on Means to Better Ensure That Federal Agency Mitigation Measures Are Attained," April 1989, Office of Federal Activities, U.S. EPA, Washington D.C.

   Comments to Office of Federal Activities on above Draft Guidance; submitted by Region I EPA, Office of Government Relations and Environmental Review, May 17, 1989

3. H.R.1114 & S.1045: These two bills currently before Congress would improve the enforcement capability of NEPA to ensure that agreed-on mitigation is carried out.

5. Dinah Bear, "Does NEPA Make A Difference?" EPA Journal, Volume 14, Number 1, Jan-Feb, 1988 p. 34-35

6. Stephen Ells, "The National Environmental Policy Act (NEPA) And Why It is in Trouble," (outline) Presented at 1989 Environmental Leadership Training Institute, Tufts University, July 1989

7. U.S. Supreme Court:
   Robertson v. Methow Valley Citizens Council, May 1, 1989
   Marsh v. Oregon Natural Resources Council, May 1, 1989
   (and Ninth Circuit decisions under which appeal was taken)

8. Eric Hyman, "Combining Facts and Values in Environmental Impact Assessment, Theories and Techniques" Westview Press, 1988

9. David Hemenway, "Monitoring and Compliance, the Political Economy of Inspection" JAI Press, Greenwich, CT 1985